

Serial No.: 10/728,379

AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior listings of claims in the present application.

What is claimed is:

1-28. (canceled)

29. (currently amended) An electro-static discharge protection device comprising:

a first conductive type layer or a first conductive type substrate;

a first conductive type well and a second conductive type well which are arranged adjacent to each other in a surface of said first conductive type substrate or said first conductive type layer;

a first high concentration first conductive type region and a first high concentration second conductive type region which are formed in a surface of said second conductive type well; and

a second high concentration first conductive type region and a second high concentration second conductive type region which are formed in a surface of said first conductive type well, wherein:

said first high concentration first conductive type region is connected with a first power supply of a potential[[:]],

said second high concentration second conductive type region and said second high concentration first conductive type region are connected with a second power supply of a potential different from the potential of said first power supply, [[and]]

Serial No.: 10/728,379

said first high concentration second conductive type region is connected with a trigger current supply circuit, and

wherein a distance between said first high concentration first conductive type region and said second high concentration second conductive type region is shorter than a further distance between said first high concentration second conductive type region and said second high concentration second conductive type region.

30. (original) The electro-static discharge protection device according to claim 29, wherein said first high concentration second conductive type region and said second high concentration second conductive type region are arranged adjacent to each other.

31. (original) The electro-static discharge protection device according to claim 29, wherein said first high concentration second conductive type region has a minimum width such that a contact can be formed in a permissible range of design rule.

32. (currently amended) An ~~[[The]]~~ electro-static discharge protection device ~~according to claim 29, comprising:~~

a first conductive type layer or a first conductive type substrate;

a first conductive type well and a second conductive type well which are arranged adjacent to each other in a surface of said first conductive type substrate or said first conductive type layer;

Serial No.: 10/728,379

a first high concentration first conductive type region and a first high concentration second conductive type region which are formed in a surface of said second conductive type well; and

a second high concentration first conductive type region and a second high concentration second conductive type region which are formed in a surface of said first conductive type well,

wherein:

said first high concentration first conductive type region is connected with a first power supply of a potential,

said second high concentration second conductive type region and said second high concentration first conductive type region are connected with a second power supply of a potential different from the potential of said first power supply,

said first high concentration second conductive type region is connected with a trigger current supply circuit,

said first high concentration first conductive type region is separated into a plurality of divisional regions which are arranged in a direction orthogonal to a direction of arrangement of said second high concentration second conductive type region and said second high concentration first conductive type region, and

said first high concentration second conductive type region extends between every two of said plurality of divisional regions.

33. (original) The electro-static discharge protection device according to claim 32, wherein the extending portion of said first high concentration first conductive type region has a minimum width such that a contact can be formed in a permissible range of design rule, and another

Serial No.: 10/728,379

portion of said first high concentration first conductive type region other than said extending portion has a width less than said minimum width.

34-39. (canceled)

40. (original) The electro-static discharge protection device according to claim 29, wherein a region where silicide is not formed is provided between said high concentration regions adjacent to each other.

41-47. (canceled)

48. (withdrawn) An electro-static discharge protection device comprising: a P-type layer or a P-type substrate; an N well which is formed in a surface of said P-type layer or said P-type substrate; a first high concentration N-type region and a first high concentration P-type region which are formed in a surface of said the N well; a second high concentration N-type region and a second high concentration P-type region and a third high concentration P-type region which are in the surface of said P-type substrate or said P-type layer; first and second resistance elements connected between said first high concentration P-type region and said first high concentration N-type region; and third and fourth resistance elements connected between said second high concentration N-type region and a first predetermined potential, wherein a trigger current supply circuit is connected with a node between said first and second resistance elements and a said third and fourth resistance elements, said second high concentration N-type region and said third high concentration P-type region are connected with said first predetermined potential, and said

Serial No.: 10/728,379

first high concentration P-type region is connected with a second predetermined potential.

49. (withdrawn) The electro-static discharge protection device according to claim 48, wherein said second high concentration N-type region and said second high concentration P-type region are arranged adjacent to each other.

50. (withdrawn) The electro-static discharge protection device according to claim 48, wherein said first and third resistance elements are connected with said first high concentration P-type region and said first predetermined potential, and have resistance values lower than a resistance value of said N well and a resistance value of said P-type layer or said P-type substrate, respectively, and said second and fourth resistance elements are connected with said first high concentration N-type region and said second high concentration N-type region and resistance values of said second and fourth resistance elements are determined based on a desired hold voltage, respectively.

51. (withdrawn) The electro-static discharge protection device according to claim 48, wherein a region where silicide is not formed is provided between said high concentration regions adjacent to each other.

52. (withdrawn) The electro-static discharge protection device according to claim 48, further comprising: a gate provided between every two of said high concentration regions, and wherein said high concentration regions are formed using said gates as a mask.

Serial No.: 10/728,379

53. (currently amended) An ESD protection circuit comprising:

a first bipolar transistor and a second bipolar transistor, said first and second bipolar transistors cooperating with one another to perform a SCR; and

a trigger device adapted to trigger ~~triggering~~ said first and second bipolar transistors substantially simultaneously.

54. (currently amended) The ESD protection circuit according to claim 53, wherein:

one end of said trigger device is connected to ~~one of a collector and an emitter~~ a base of said first bipolar transistor, and

another end of said trigger device is connected to ~~one of a collector and an emitter~~ a base of said second bipolar transistor.

55. (currently amended) The ESD protection service according to claim 54, further comprising a first resistance element,

wherein said one end of said trigger device is connected to said ~~one of said collector and said emitter~~ base of said first bipolar transistor via said first resistance element.

56 (previously presented) The ESD protection circuit according to claim 55, further comprising a second resistance element,

wherein said another end of said trigger device is connected to a ground via said second resistance element.

Serial No.: 10/728,379

57. (currently amended) The ESD protection circuit according to claim 56, wherein said another end of said trigger device is connected to said ~~one of said collector and said emitter~~ base of said second bipolar transistor via said second resistance element.

58. (currently amended) The ESD protection circuit according to claim 54, wherein:

~~said one of said collector and said emitter of said first bipolar transistor~~ an anode of said SCR is connected to a pad, and
~~said one of said collector and said emitter of said second bipolar transistor~~ a cathode of said SCR is connected to a ground.

59. (currently amended) An ESD protection circuit comprising:

a first well of a first conductive type, said first well having a first region of said first conductive type and a second region of ~~[[said]]~~ a second conductive type;

a second well of a second conductive type, said second well having a third region of said first conductive type and a fourth region of said second conductive type; and

a trigger device,

wherein said first well, second region and ~~third region~~ second well cooperate with each other to perform a first bipolar transistor;

said first well, said second well and said third region cooperate with each other to perform a second bipolar transistor;

said first and second bipolar transistors cooperate with one another to perform a SCR;

and

Serial No.: 10/728,379

one end of said trigger device is connected to said first region, and another end of said trigger device is connected to said ~~third~~ fourth region.

60. (previously presented) The ESD protection circuit according to claim 59, further comprising:

a pad; and

a resistance element;

wherein said pad is connected to said first region via said resistance element; and

said one end of said trigger device is connected to said second region via said resistance element.

61. (previously presented) The ESD protection circuit according to claim 59, further comprising a resistance element,

Wherein said another end of said trigger device is connected to said third region and a ground via said resistance element.

62. (previously presented) The ESD protection circuit according to claim 59, wherein said trigger device triggers said first and second bipolar transistors substantially simultaneously.

63. (previously presented) The ESD protection circuit according to claim 59, wherein said first region and said second region are free from being intervened by insulating film therebetween.

Serial No.: 10/728,379

64. (previously presented) The ESD protection circuit according to claim 59, wherein said third region and said fourth region are free from being intervened by insulating film therebetween.